AMENDMENTS TO THE CLAIMS:

Claims 1-16 are currently pending in the present application. Please substitute currently amended claims 1, 2, 13, 14 and 16 as provided below, for claims 1, 2, 13, 14 and 16 in the present application.

1. (Currently Amended) A robust adaptive filter comprising:

a fast impulse response filter;

a coefficient vector update device connected to said fast impulse response filter for feeding adaptive coefficients thereto in response to a received error signal; ~~and~~

a modifying device for modifying said adaptive coefficients by application of an adaptive scaled non-linearity~~.~~**; and**

a double talk detector connected to said coefficient vector update device for disabling said update device in response to the detection of double talk on a telephone circuit.

2. (Currently Amended) A robust adaptive filter comprising:

an adaptive filter utilizing a fast converging adaptive algorithm; ~~and~~

means for modifying said algorithm by the application thereto of an adaptive scaled non-linearity~~.~~**; and**

a double talk detector connected to said adaptive filter for disabling said adaptive filter in response to the detection of double talk on a telephone circuit.

3. (Original) The filter of claim 2, wherein the fast converging algorithm is PNLMS.

4. (Original) The filter of claim 2, wherein the fast converging algorithm is PNLMS++.

5. (Original) The filter of claim 2, wherein the fast converging algorithm is APA.

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6. (Original) The filter of claim 2, wherein the fast converging algorithm is PAPA.

7. (Previously Amended) The filter of claim 3, wherein the adaptive scaled non-linearity is given by the formula:

$\Psi\left(\frac{|e_n|}{s}\right)$ sign $\{e_n\}s_n$, wherein Ψ is a hard limiter; and $\left(\frac{|e_n|}{s}\right)$ is the mean error divided by a scale factor; and $\{e_n\}$ is a sample of echo signal; and s_n is a scale factor.

8. (Previously Amended) The filter of claim 4, wherein the adaptive scaled non-linearity is given by the formula:

$\Psi\left(\frac{|e_n|}{s}\right)$ sign $\{e_n\}s_n$, wherein Ψ is a hard limiter; and $\left(\frac{|e_n|}{s}\right)$ is the mean error divided by a scale factor; and $\{e_n\}$ is a sample of echo signal; and s_n is a scale factor.

9. (Previously Amended) The filter of claim 5, wherein the adaptive scaled non-linearity is given by the formula:

$\Psi\left(\frac{|e_n|}{s}\right)$ sign $\{e_n\}s_n$, wherein Ψ is a hard limiter; and $\left(\frac{|e_n|}{s}\right)$ is the mean error divided by a scale factor; and $\{e_n\}$ is a sample of echo signal; and s_n is a scale factor.

10. (Previously Amended) The filter of claim 6, wherein the adaptive scaled non-linearity is given by the formula:

$\Psi\left(\frac{|e_n|}{s}\right)$ sign $\{e_n\}s_n$, wherein Ψ is a hard limiter; and $\left(\frac{|e_n|}{s}\right)$ is the mean error divided by a scale factor; and $\{e_n\}$ is a sample of echo signal; and s_n is a scale factor.

11. (Original) A robust echo canceller for use in a telephone circuit, comprising:

an adaptive filter connected to said telephone circuit for outputting an error signal corresponding to a detected echo signal;

a vector coefficient update device connected to said filter for feeding adaptive filter coefficients thereto in response to a modified error signal; and

a device for modifying said adaptive coefficients by modifying said error signal through the application of an adaptive scaled non-linearity to said error signal to generate said modified error signal.

12. (Original) The echo canceller of claim 11, further comprising a double talk detector connected to said telephone circuit for disabling said update device in response to the detection of double talk on said circuit.

13. (Currently Amended) A robust echo canceller comprising:

an adaptive filter for outputting an error signal in response to a detected echo signal; and

means for supplying adaptive filter coefficients to said filter, wherein said filter coefficients are given by the formula: $h_{n+1} = h_n + \frac{\mu}{x_n^T G_n x_n + \delta} G_n x_n \varphi(|e_n|) sign\{e_n\}$, wherein h_n is the estimated echo path; μ is the overall step size parameter; G_n is the excitation matrix; x_n is the excitation vector; δ is the regularization parameter that prevents division by zero; $|e_n|$ is the mean error; and $\{e_n\}$ is a sample of echo signal.

14. (Currently Amended) The echo canceller of claim 13, further comprising a double talk detector connected to ~~said~~ **a** telephone circuit for disabling said ~~update device~~ **means for supplying adaptive filter coefficients** in response to the detection of double talk on said circuit.

15. (Previously Amended) A robust echo canceller comprising:

an adaptive filter for outputting an error signal in response to a detected echo signal; and

means for supplying adaptive filter coefficients to said filter, wherein said filter coefficients are given by the formula: $h_{n+1} = h_n + \mu G_n X_n R_{xx}^{-1}(n)\left[\varphi(|e_n|) \circ \operatorname{sign}(e_n)\right]$, wherein h_n is the estimated echo path; μ is the overall step size parameter; G_n is the step-size matrix; X_n is the excitation matrix; R_{xx}^{-1} is the correlation matrix; $|e_n|$ is the mean error; $\circ$ denotes elementwise multiplications; and $\{e_n\}$ is a sample of echo signal..

16. (Currently Amended) The echo canceller of claim 15, further comprising a double talk detector connected to ~~said~~ **a** telephone circuit for disabling said ~~update device~~ **means for supplying adaptive filter coefficients** in response to the detection of double talk on said circuit.